A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance from the Nova School of Business and Economics.

Private Equity Challenge: Vidrala as a potential LBO target

João Manuel Pereira Gonçalves

Work project carried out under the supervision of:
Professor Fábio Santos

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Abstract: The goal of this thesis is to assess Vidrala as a potential leveraged buyout target. Market and company overviews were performed to evaluate the company´s positioning and financial performance, as well as future trends within the glass packaging industry, the respective end-markets and other packaging solutions. This analysis was used to select the most suitable investment strategies and quantify the resulting business plan in financial terms. Finally, a valuation using several methods was conducted from which a capital structured was designed and potential returns calculated. This part will cover returns, exit strategies and risks and due diligence.

Keywords: Private Equity, Leveraged Buyout, Glass Packaging Market, Vidrala

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Vidrala's presence in a mature market with stable and predictable cash flows makes for a very attractive M&A target

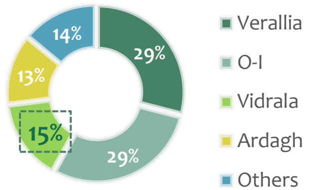
Company Overview

- Founded in 1965, Vidrala currently has **8 factories** spread across **5 countries**, being a dominant player in the Western European Market and serving approximately **1 600 customers**
- The management team has **created a strong player** in the respective geographies **through several successful M&A transactions**
- Vidrala has been showing a **stable and predictable cash flow generation** and a **leverageable balance sheet**

Industry Overview

- Being highly **dependent on the respective end markets**, this industry's main drivers are **population growth, urbanization**, the sustainability trend and the **premiumization** of the end markets, with the latter **increasing the penetration rate of glass** over other packaging options

Main competitors in Western Europe



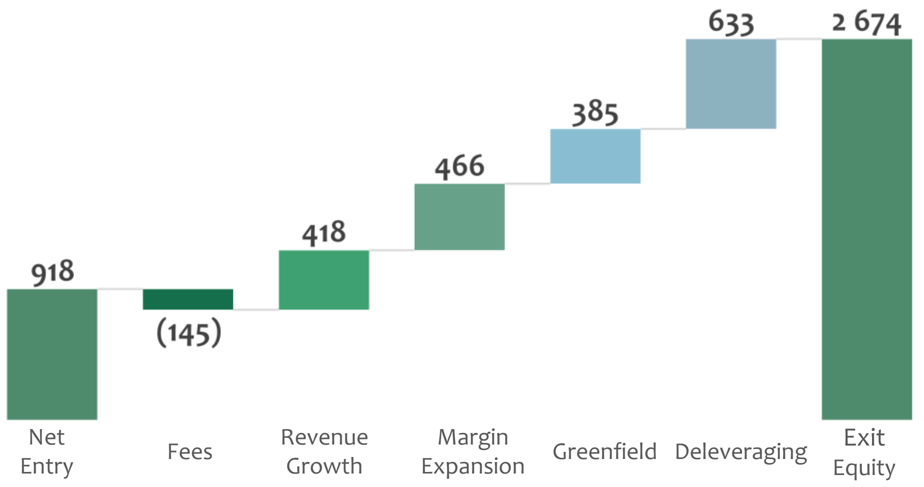
Investment Rationale

- Following the industry trend and company strengths, **M&A consolidation** creates value by **increasing exposure in key geographies** and **diversifying product portfolio**
- Leveraging the company's focus on **automation** and **increasing usage of cullet** allows to increase EBITDA margins of the company
- Using excess cash to **develop factories in glass net importing countries** adds more value than deleveraging further

Entry

- **Entry will be priced at 7.5x EBITDA,** according to the relative valuation. Overall, the acquisition of Vidrala and its target Zignago Vetro plus banking and due diligence fees results in a cost of **€ 2.67Bn**
- The capital structure is composed by **66% of debt and 34% of equity**, optimizing returns and respecting covenants
- Management team will represent **10%** of the institutional investment contributing with **€ 6.3M**, twice its fixed annual salary

Value Creation (in million €)



Exit

- The exit is planned for 2025. Entry multiple, acquisition leverage and operating model yield the following returns:

	Money Multiple	IRR
Inst. Investors	2.8x	23.6%
Mang. Team	20.9x	83.7%

- The **exit strategies** considered most suited for the deal are **IPO** due to deal-size and **Strategic Sale** due to potential synergies and consolidation trend

By investing in strategic acquisitions Vidrala has become one of the main players in the Western European market

vidrala

Company profile

- Vidrala is **a leading producer of glass containers** for the **food & beverage industries**
- It also **provides packaging services** such as beverages filling and logistic activities, which account for less than 10% of revenues
- Sales by product segment in 2019:

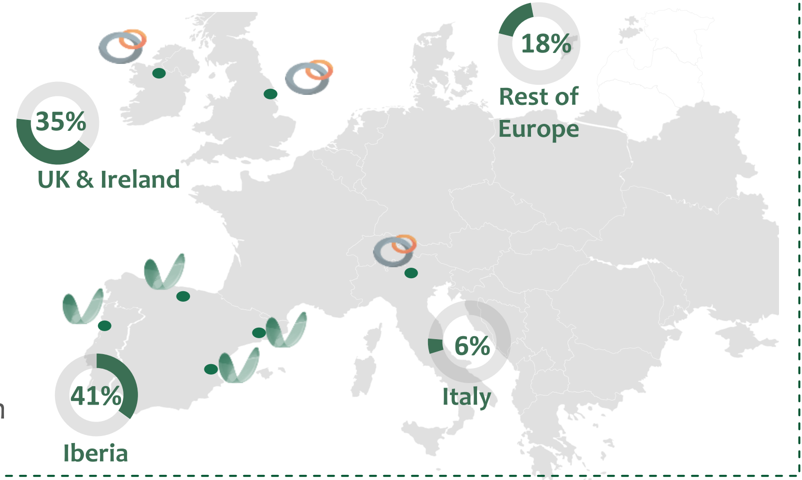
Wine	Beer	Food	Spirits	Soft Dtinks	Others
35%	30%	10%	9%	9%	7%

- Its strategy is to be the European low-cost producer, always **focused on customers** and **competitiveness**, through **sustainable** and **cost-efficient** processes

Outreach and sales by region

It currently operates through:

- **8 factories** in
- **5 countries**, producing around
- **8 billion containers** per year
- Serving **1 600 customers** and
- Retaining **15%** of the Western European market



1965-1967	1967-1981	1981-1998	1998-2003	2003-2015	2015-2019
25,000 tons	130,000 tons	450,000 tons	805,000 tons	950,000 tons	1,600,000 tons
1965 – The company was installed in Llodio, (Alava – Spain) in 1965 **1966** - Creation of Vidrierías de Álava S.A. Its manufacturing activity began in 1966 with one furnace, two machines **1967 –** Begins exporting	**1977**- Beginning of press & blow production of light bottles makes Vidrala the technological leader of the national market **1981**- Transformation of furnaces, generating **an energy saving of 50%,** maintaining productive capacity. Corporate name changed to Vidrala S.A.	**1985** - **Vidrala's shares** were launched on the stock market **1989** - Crisnova, a 100% subsidiary of Vidrala, started its activity in Caudete **1995** - **Third Aiala's furnace** was built up **1998** - **Second Crisnova´s furnace** came into operation	**2001** - Approval of the Strategic Plan of corporate growth **2003 – Beginning of Internationalization process:** Entry into Portuguese market with acquisition of Ricardo Gallo Vidro de Embalagem	**2005 –** Acquisition of a new plant in Spain and entry in **Italian** Market through acquisition of a factory **2007 –** Entry into **Belgian market** through acquisition of La Manufacture du Verre **2015 –Entry into UK and Ireland** markets through the acquisition of Encirc Limited	**2015 –**Vidrala becomes 4th largest European player, and offers a complete range of services **2017** - Acquisition of a new factory in Portugal (Santos Barosa) **2019 –** Sale of La Manufacture du Verre, ending the presence in the Belgian Market

- Production Capacity - Establishment - Organic Growth - Acquisitions

Sources: Company´s Published Reports

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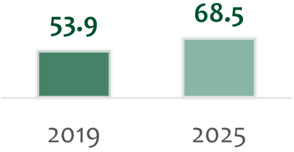
Considering market trends, glass will have an important role in the future of packaging

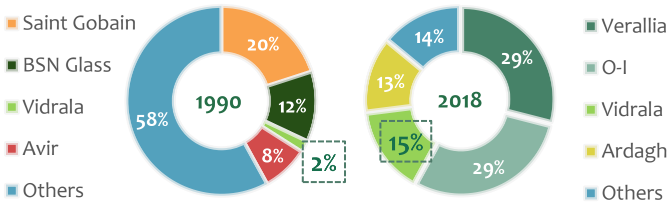
Glass bottles and containers Market

Global market size (in billion €)



- **It is expected to grow at a CAGR of 4.1%** between 2020 and 2025
- **Asia pacific is the biggest market ,** followed by **Europe**, where Germany, France and Russia account for a significant part of the revenues
- The market is competitive and increasingly concentrated

Main competitors in Western Europe



- The majority of glass packaging consumption is made by the **alcoholic beverages industry**, with beer contributing with the greatest volume

Key Trends

Increasing concerns about the environment are leading consumers towards more **sustainable choices** Glass is 100% recyclable	**Premiumization** People are looking for higher quality products, and do not mind paying a premium Glass allows for attractive design	Healthier consumers demand **healthier products** Glass has no affinity, guarantees quality

Growth Drivers

- Increasing urban population and purchasing power
- Growing demand for alcoholic beverages, especially for beer
- Growing number of policies to reduce the use of plastics
- Increasing wine trade
- Fast growing pharmaceutical and cosmetics segments

Value Chain

SUPPLIERS → PACKAGING MANUFACTURING → PRODUCTS MANUFACTORING → DISTRIBUTION → RETAIL

KEY PLAYERS

USER

CIRCULAR ECONOMY

CULLET

Glass Discarded in Production

Municipal Waste Collection

COLLECTION AND TREATMENT

RECYCLING

Sources: Statista, Company's publications, Mordor Intelligence, Passport

Net importers of glass in Eastern Europe and North Africa represent the best opportunities for a greenfield expansion

Entering New Markets

End Markets size (in million €) and growth

	Western and Central Europe*	North Africa	Eastern Europe	Northern Europe
Alcoholic drinks	208 530	3 221	57 215	32 728
CAGR 2019-2023	*2.5%*	*6.5%*	*4.4%*	*2.3%*
Non-Alcoholic drinks	137 137	18 501	19 400	10 440
CAGR 2019-2023	*2.5%*	*11.5%*	*6.3%*	*3.3%*
Food	639 913	131 212	323 516	81 077
CAGR 2019-2023	*1.9%*	*8%*	*2.4%*	*1.7%*
Beauty and personal care	58264	9 861	19 000	6 021
CAGR 2019-2023	*1.9%*	*3.1%*	*2.7%*	*2%*
OTC Pharmaceuticals	101 533	1 249	3 594	1 278
CAGR 2019-2023	*3.7%*	*2%*	*3.1%*	*3.1%*

* Does not include Portugal, Spain nor Italy

Why Beauty and Personal care?

Mainly driven by **consumer spending**, the market is growing as beauty products increasingly make part of daily routines. High growth opportunities, especially for **prestige and luxury products**, account for 25% of revenues. In UK, Italy and Spain, where Vidrala already operates, the share of people that buys these products is **28%**, **22%** and **21%**, respectively

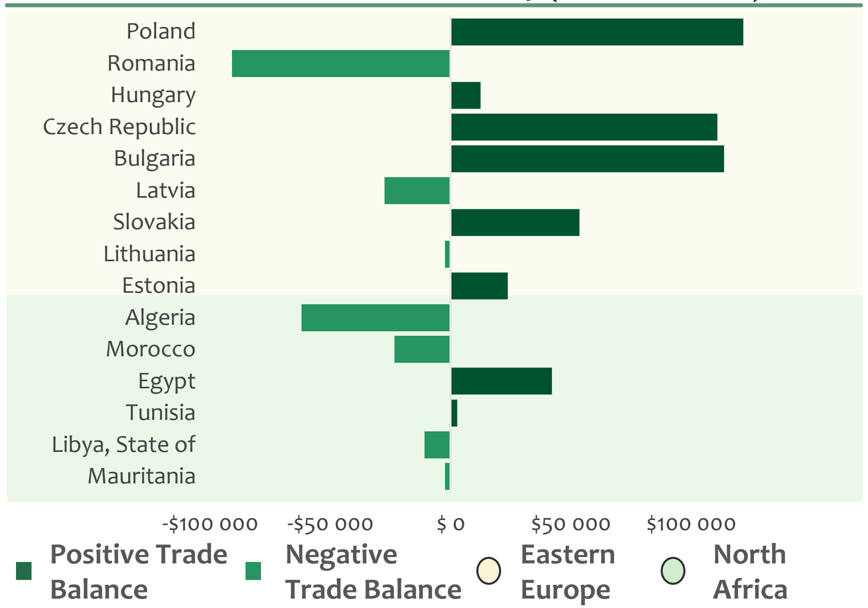
People are looking for **visually appealing, sustainable and more natural products**, with a packaging that allow them to see its quality

Why Pharmaceuticals?

Increasing consciousness about health and access to health care are driving the demand for pharmaceuticals up, particularly in middle income countries where it is growing at a faster pace

Countries where Vidrala currently operates have **high access to medicine**. Glass is one of the main **packaging solutions** for medicine and drugs, allowing the products to keep their properties and contributing to sustainability

Glass Trade balance in 2019 (USD thousand)



Trade balance of the countries allow us to deepen our analysis regarding which markets to entry, since it shows us where demand is larger than what is being produced by the local producers

- In Eastern Europe: **Romania and Latvia** seem to be the regions where there is greater room for more producers
- Regarding North African countries, there seems to be a lot of opportunities: Algeria, Morocco and Libya. However, in these countries a thorough analysis regarding **political and economical stability** needs to take place

Sources: Trade Map, Statista

1

- Vidrala has been actively participating in M&A by acquiring manufacturing sites in strategical locations
- In 2015 Vidrala acquired its **UK & Ireland divisions** which added over **€ 300M** in revenue. Organic growth rate was 2.3%
- In 2017 Vidrala completed another acquisition, **Santos Barosa** in Portugal, adding over **€ 140M** in revenue
- In 2019 the **Belgium site was sold** to Carlyle Group Owned, Saverglass
- Vidrala's strategy focuses on **cost optimization** and **product mix diversification**

2

- The acquisition of the UK & Ireland divisions hurt Vidrala's margins as these divisions had **significantly higher costs** compared to others. In 2015, UK & Ireland had EBITDA margins close to 18% while other segments had close to 21%, with the **Iberian Peninsula being the most profitable** at circa 30%. Currently, UK has margins closer to 25%

3

- Energy consumption, specifically, electricity and natural gas represent one of the largest cost drivers as this industry is **very energy intensive**
- Sales expense refers to **storage and transportation** costs regarding its logistic services, another large standalone cost driver

4

- Employee Expenses and External Services (more specifically, maintenance and Insurance) are the **two least variable** captions when analysing a fixed vs variable cost basis
- Overall, of 2019 costs, 31.1% of the total costs are considered **Fixed Costs**

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M&A Activity is boosting growth and margins

Vidrala's Income statement key captions 2012-2019

in Million €	2012	2013	2014	2015	2016	2017	2018	2019	
Revenues	**458**	**474**	**469**	**803**	**774**	**823**	**955**	**1 011**	
Organic Growth Rate	N/A	*3.5%*	*(1.0%)*	*2.3%*	*(3.7%)*	*(3.8%)*	*16.1%*	*5.8%*	1
Inorganic Growth Rate	N/A	*0.0%*	*0.0%*	*69.1%*	*0.0%*	*10.2%*	*0.0%*	*0.0%*	
COGS	(156)	(157)	(164)	(304)	(279)	(277)	(318)	(320)	
Gross Profit	**301**	**317**	**304**	**499**	**495**	**546**	**637**	**691**	
Gross Margin (%)	*65.8%*	*66.8%*	*64.9%*	*62.2%*	*64.0%*	*66.4%*	*66.7%*	*68.4%*	
Employee Expenses	(100)	(100)	(96)	(166)	(166)	(175)	(190)	(198)	4
Other Expenses	(102)	(106)	(102)	(178)	(162)	(181)	(204)	(207)	
Other EBITDA Adjustments	2	3	1	(3)	5	(1)	(2)	(25)	
Adjusted EBITDA	**102**	**114**	**107**	**152**	**172**	**190**	**242** 2	**262**	
EBITDA Margin (%)	*22.2%*	*24.1%*	*22.8%*	*18.9%*	*22.2%*	*23.1%*	*25.3%*	*25.9%*	
NOPAT	**46**	**58**	**50**	**57**	**75**	**86**	**121**	**135**	
NOPAT Margin (%)	*10.0%*	*12.2%*	*10.6%*	*7.1%*	*9.6%*	*10.4%*	*12.6%*	*13.4%*	

1

in Million €	2018	2019
Revenues	**955**	**1 011**
Iberian Peninsula	567	597
UK & Ireland	334	351
Italy	54	63
Rest of European Union	–	–

3

in Million €	2018	2019	
Other expenses	**(204)**	**(207)**	
External Services	(46)	(45)	4
Electricity	(54)	(51)	
Sales Expenses	(88)	(93)	
Taxes	(6)	(5)	
Other Operating expenses	(9)	(13)	

Sources: Vidrala's annual reports

Vidrala has the highest ROA among its peers

1

- The period between 2014 and 2019 shows a declining trend in the cash conversion cycle of the firm. The component that has contributed more towards this trend is **the decline in the holding period**, meaning the firm took less time to sell its inventories. There was also **an upward trend on the Payable period** since as the company scales up, it has more bargaining power with its suppliers
- Regarding Vidrala´s position compared to its peers, it is observed that smaller players like Zignago Vetro and Vetropack have the worst cycles

2

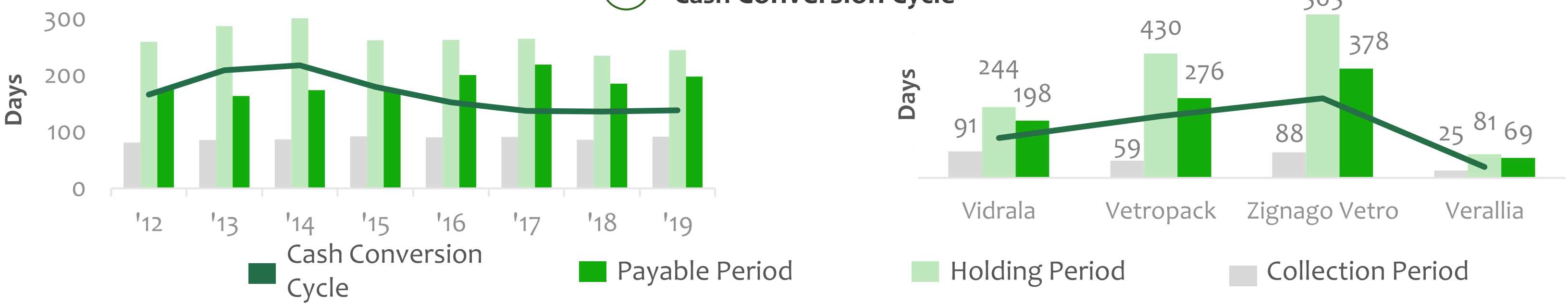
- In the last 5 years there was an increase in the Return on Assets of the company. This happened due to **improvements in the efficiency** translated in the operational margins but also, because of a positive trend in the capacity **of generating more sales with the assets of the company***
- The second graph shows that Vidrala presented in 2019 the biggest ROA. When looking at the Asset turnover, it is seen that the best companies were Verallia and Vetropack. However, in the operational margin these 2 players are not as good

3

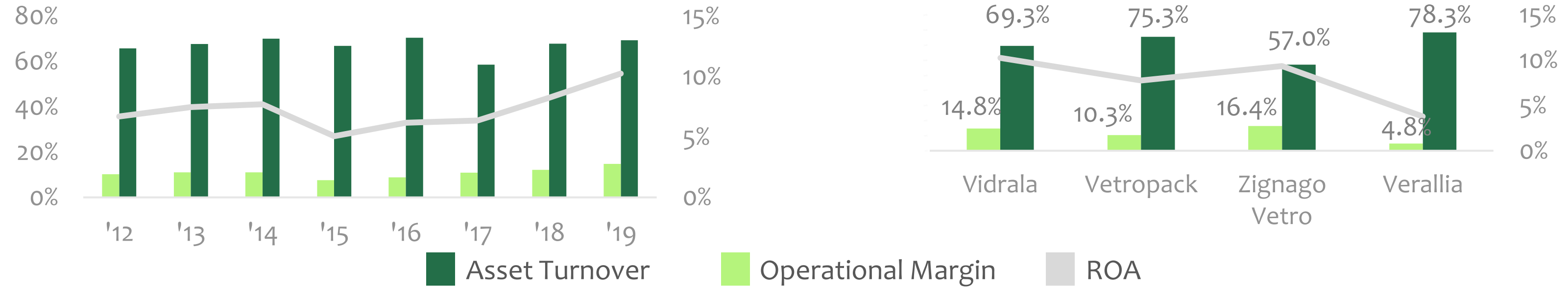
- The Return on Equity also shows an up-warding trend. This happened because although there has been a deleveraging of the company in the last 3-4 years, **the increases on Return on Assets more than compensated this negative trend in leverage**
- Verallia is the player with the lowest return on assets and the highest ROE, which is driven by the highest level of leverage within its peers

*The decline in Asset turnover in 2017 happened due to the acquisition of Santos Barosa, since it increased significantly the amount of assets the company had

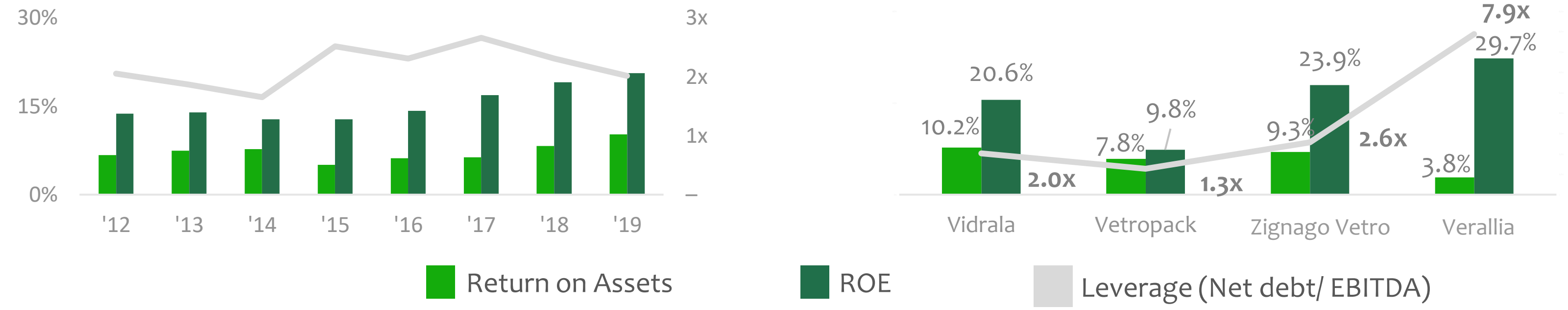
1 **Cash Conversion Cycle**



2 **Return on Assets (ROA)**



3 **Return on Equity (ROE)**



Sources: Vidrala's annual reports

Buy-and-Build, Operational improvements and Greenfield development are the most adequate strategies to create value for Vidrala

Deal Rationale

Strong Financials	Experienced Team	M&A Track Record	Consumer Trends
- Vidrala has a **leverageable Balance** Sheet with large assets to collateralize - Vidrala's **strong and predictable cash flow** generation allow M&A Activity - Good **competitive positioning** with large customer portfolio	- Management team has **high tenure** in the company with **deep industry knowledge** - Focus on **operational improvements** through M&A and it is observable in **revenue per employee** levels	- Two large **acquisitions in the past** 5 years with **successful integration and operational improvement** - Focus on product **portfolio diversification** and margins **optimization**	- General perception of **Glass as a safe** packaging material - **Premiumization** of beverages increases demand for glass packaging - Increasing consumer demand for **environmentally sustainable products**

Value Creation Strategies

Buy-and-Build

Horizontal Integration

Rationale

- Use Vidrala's high & stable FCF generation and Management Team's experience to **acquire targets in strategical geographies** and **diversify product portfolio**
- **Continue to consolidate the western Europe market position**

Synergies

- Increase of Automation
- Decrease of Sales Expenses
- Increase in usage of recycled glass
- Increase presence and improvement of Vidrala's division in Italy
- Increase product portfolio and new end market

Operational Improvements

- Continuation of the **automation trend**, in line with company´s **investment in R&D,** in areas such as robotics and big data, that until now have translated into the **highest revenue per employee among competitors**

- Savings in energy and COGS will be driven by: **increase in usage of cullet, increased use of renewable sources** and possible **recovery of heat to be re-used in the production process** (TASIO UE project)

Greenfield Development

- Building a new plant can bring several opportunities to grow. Vidrala will be able to **capture an important fraction of the market,** taking advantage of its experience and **efficiency to outperform current players**
- Adrian Curry, Encirc's general manager, has **experience in setting plants from scratch** and can contribute with his expertise

Plan A consists of acquiring Zignago Vetro, due its product portfolio and strong positioning in Western Europe

vidrala

Acquisition plans

Plan A – Zignago Vetro

Zignago Vetro is the best acquisition target for Vidrala since it checks most criteria the company defined in 2015 when acquiring Encirc:

- Customer diversification
- Different Product-Mix weights
- Consolidation of the **Western Europe market**
- Usage of higher cullet rates **due to already existent vertical integration**

In addition, Zignago Vetro has a more complete product portfolio than Vidrala, adding:
- Cosmetics and Perfumery
- Specialty Glass Containers

Zigango's presence in Italy can also be **leveraged to improve the overall performance of the group's operations in that country**

Zignago's ownership of joint ventures Vetri Speciali and Vetreco, 50 and 30% respectively, are not considered since these targets are not strategically fit

Plan B – Vetropack

If for any reason the acquisition of Zignago Vetro fails a Plan B is considered

Most criteria also check for Vetropack however, **with less influence in the Western Europe Market**

Vetropack also has a larger product portfolio than Vidrala:
- Pharmaceutical Packaging

Plan C – Smaller acquisitions

If the acquisition of Vetropack is not possible smaller acquisitions should be considered according to the **established criteria**

Note that probably these companies will not have recycled glass providers, and so**, in this case vertical integration should also be considered**

Why Zignago over Vetropack?

There are three main reasons to choose Zignago over Vetropack:

- **Core Markets**

Zignago Vetro has presence in a Western European Market where Vidrala is not (France)

- **Potential Deal Size**

Vetropack has a much larger EBITDA than Zignago (€ 170M vs € 79M) which would bring higher risk to the deal, albeit Zignago's EBITDA is still relevant

- **Better EBITDA margins**

Zignago Vetro has already better margins than Vetropack

Criteria for Other Targets

In case both deals fail it is important to define some criteria so that the deal succeeds:

Tier 1:
- Presence in Western Europe
- Product-Mix
- Operational Margins

Tier 2:
- Deal size or combined size of the companies acquired
- Cullet utilization rate
- Speed of the Due Diligence Process

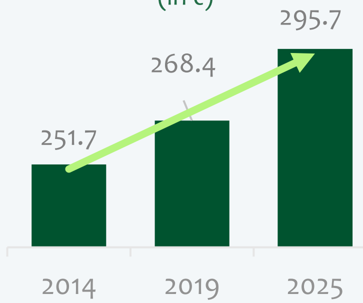
Moreover, **vertical integration can also be considered** in order to increase the cullet utilization rates. One example could be **Eurovetro*,** which is only, 20 minutes away from Vidrala's facilities in Italy

Sources: Vidrala, Zignago Vetro, Vetropack, Eurovetro, Google Maps

Notes: *Company profile in the appendix

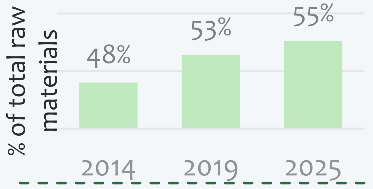
Automation and integration of big data will be the main operational improvements behind the increase in EBITDA margin

Revenue per employee
(in €)



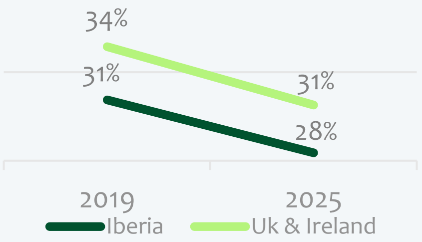
- Maintain the path of automation and digitalization of the production process with inclusion of robotics and bid data into making the production process as efficient as possible
- From 2014 to 2019, the company increased the ratio of revenue per employee from € 251.7 to € 268.4. In the upcoming years, the companies' investment in R&D will be maintained and push the **Vidrala Academy towards the goal of achieving a revenue per employee of € 295.7**
- This obviously **directly impacts the personnel expenses** and consequently key performance ratios such as the EBITDA margin

Rate of Cullet Inclusion



- As a member of the FEVE association, Vidrala has **committed to increase the % of cullet in its production process.** This will allow the company to **decrease the costs associated with electricity and raw materials** and to increase the capacity of each furnace, since the duration of the melting process also decreases with the usage of cullet*

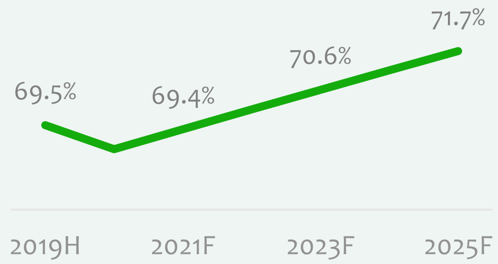
COGS as % of Revenue



- Investments are planned with the goal of increasing efficiency and consequently **reduce the weight of the raw materials in the cost structure** of the company. The investments in furnace upgrades promise to bring marginal decreases in the % of COGS relative to sales along the next years. At the same time, Investments in the UK & Ireland region are expected to push this segment of the company closer to the margins of the rest of the group and decrease the weight of the COGS to around 30% of revenues

In order to be able to achieve these improvements, Vidrala will have to keep investing in technology. This way, beyond the expansion capex, the levels of capex will be 16% higher (the average for the last 3 years) than the level of maintenance capex that is considered equal to depreciation

Vidrala Gross Margin



Vetropack Gross Margin 2019

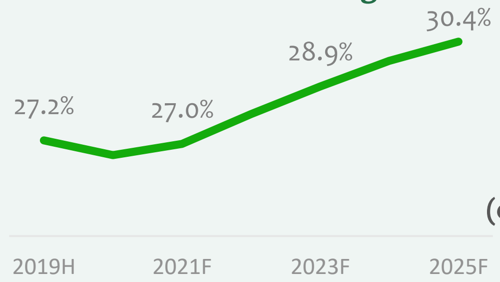
85.9%

Zignago Vetro Gross Margin 2019

82.1%

The efforts to include of Cullet and furnace upgrades will cause an increase on the gross margin of Vidrala, moving progressively closer to the gross margins of certain competitors/ targets of similar size to Vidrala

Vidrala EBITDA Margin



Vetropack Ebitda Margin 2019

23.3%

Zignago Vetro Ebitda margin 2019 (excluding joint ventures)

26.5%

The continuous investment regarding the integration of robotics and big data in the production process will continue to increase the revenue per employee and **will positively impact the EBITDA margin of the company**

Sources: *Research Gate, Impact of Glass Cullet on the Consumption of Energy and Environment in the Production of Glass Packaging Material

Although the industry is going through a consolidation proccess, Romania is suited for a greenfield development due to its glass trade balance, market size and growth

Investment and Timing

Investment required
€ 134.6 million

Construction of the plant will start in the **beginning of 2021**

Years until plant starts producing
1 year

Production capacity in

1st Year	2nd Year	3rd Year
50%	**70%**	**100%**

Investment and Timing

The location chosen to build the new plant was

2 Furnaces

300+ Employees

Criteria

- Romania is a **net importer of glass containers**
- It is an Eastern European country, giving Vidrala the oportunity to benefit from **big markets with higher growth rates**
- Its **proximity** to several other countries in this region that Vidrala may serve as well: Moldavia, Ukraine, Bulgaria, Serbia and Hungary
- **Lower** labor, land and production **costs**
- **Low tax rate**

Assumptions

Revenue- average revenue per furnace was used and an **assumption regarding the number of furnaces to build** was made according to the demand identified by the group according to the size of the market, growth rates and trade balance

Gross PP&E per plant- Average of the current GPP&E per furnace was used. Although **land might be cheaper in Romani**a, there is great uncertainty about other possible investments

Net Working Capital- Worst captions of last 4y of Vidrala were assumed as a starting point, with **improvements taking place over the years**

Employee Expenses- Calculated **according to Average Hourly manufacturing costs** in Romania (Eurostat), evolving according to inflation throughout the years. Contributions to Benefit plans calculated according to Vidrala standards

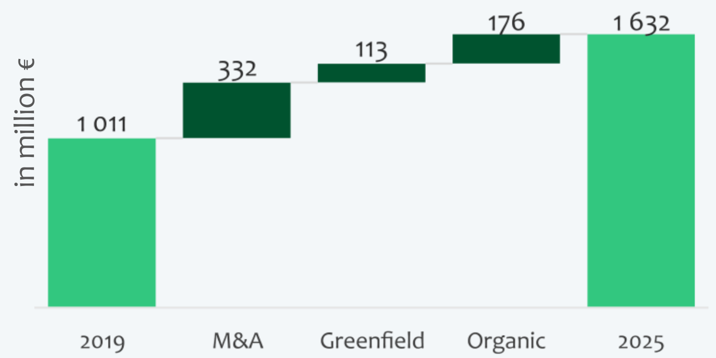
Key Financials

Millions of €	2021	2022	2023	2024	2025	2026
Revenues	-	53.2	85.1	109.6	113.0	117.4
Gross Profit	-	27.9	50.7	76.1	79.1	82.5
Gross margin	-	52.4%	59.5%	69.4%	70.0%	70.3%
EBITDA	-	9.2	27.1	48.7	51.0	53.5
EBITDA Margin (%)	-	17.3%	31.8%	44.4%	45.1%	45.6%
EBIT	-	(0,2)	17,6	39,2	41,6	44,1
EBIT Margin (%)	-	(0.4%)	20.7%	35.8%	38.3%	39.1%
NOPAT	-	(0.2)	14.8	33.0	34.9	37.0
Δ in Net Working Capital	-	(13.2)	(7.5)	(5.7)	(0.2)	(0.4)
CAPEX	(134.6)	(9.5)	(9.5)	(9.5)	(9.5)	(9.5)
FCF	(134.6)	(13.4)	7.3	27.2	34.7	36.6

Sources: Vidrala Annual Report, Glass International, Eurostat, IMF

The Business Plan forecasts an additional € 621M in Revenue and € 247M in EBITDA

Top Line



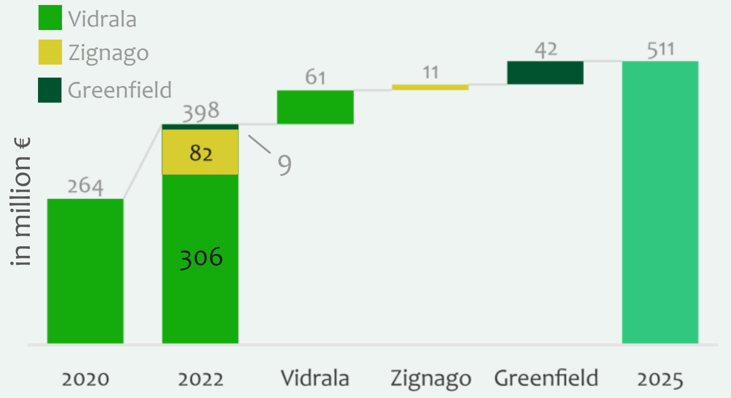
Organic Growth

- GDP Growth and share of Urban population are the **main growth drivers**
- Premiumization of alcoholic beverages increase demand for glass

Inorganic Growth

- Acquire an additional **€ 332M in 2022** in Europe to expand presence in Italian market and add exposure to the Pharmaceutical & Cosmetics end markets as well as other European Countries
- Leverage targets' connections with cullet providers to increase share of recycled glass

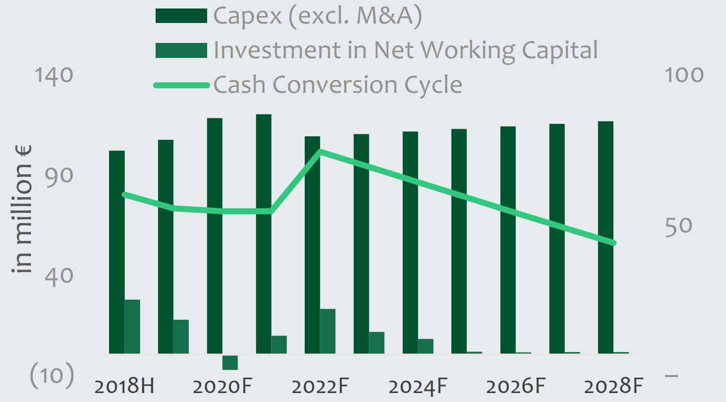
Bottom Line



Margin Uplift

- Main source of EBITDA Margin expansion comes from **COGS** as acquiring companies who use more recycled glass allow for lower COGS and accelerate the glass production process
- By using a higher share of recycled glass in the manufacturing process, Vidrala **reduces Electricity costs** as glass takes less time in the furnaces to be complete
- Finally, by introducing Vidrala's significantly more automated process to its target, it allows to **reduce Employee Expenses** in the acquired targets

Expansion



Capex

- Maintenance CAPEX is **expected to remain at historical levels**, with a slight increase for Vidrala's current schedule

Net Working Capital

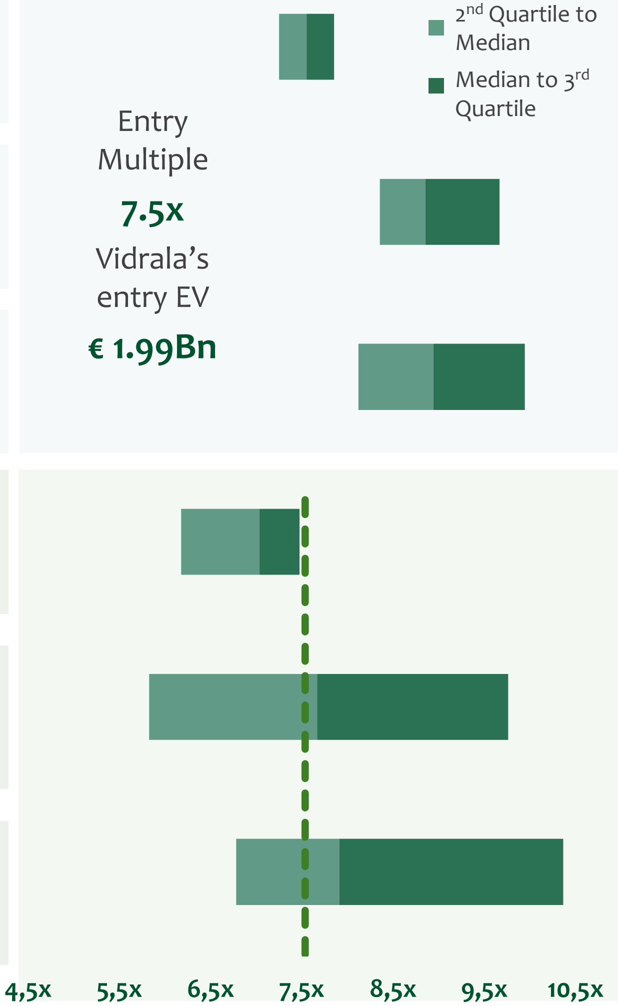
- Investment in Net Working Capital is expected to follow the historical **correlation with company growth**
- Furthermore, **inventory synergies** are expected to be introduced by increasing the business scale. Using a conservative forecast of a 2.5% yoy improvement, CCC is expected to **decrease down to 44 days in 2028**

Values in M EUR

Combining several valuation methodologies resulted in a multiple of 7.5x, which correspond to an enterprise value of € 2Bn for Vidrala

Method	Vidrala´s Entry multiple and Enterprise Value
LBO Valuation **7.6x** 7.3x-7.9x	
Share Price **8.9x** 8.4x-9.7x	
DCF model **8.9x** 8.1x-9.9x	
Past Transactions **7x** 6.2x-7.5x	
EV/EBITDA cycle **7.7x** 5.8x-9.8x	
EV/EBITDA **7.9x** 6.8x-10.4x	

Entry Multiple
7.5x
Vidrala's entry EV
€ 1.99Bn



Methodology

Reality Check

LBO Valuation
The LBO method **reflects the entry multiple** that by considering the exit proceeds **allows the fund to obtain the target return** (20%-30%)

Share Price
The share price analysis is a **reality check** for the entry multiple as it reflects the company's market value. To perform this valuation, **data from the last two years** was used

DCF Model
For the DCF model valuation, it is considered Vidrala's predicted **free cash flows without synergies**, a WACC of 6.5% (Bloomberg Estimate) and a perpetual growth rate of 0.5%, which are then used for sensitivity

Relative Valuation

Past Transactions
This method includes information from **8 past transactions from the last 6 years**, which were considered relevant for our valuation. However, it is important to stress that some **deals' sizes were smaller** than the current one

EV/EBITDA Cycle
This method was used in order to understand how the multiple has **been evolving over time.** For this purpose, the next twelve months EV/EBITDA multiples from the last 10 years were retrieved

EV/EBITDA
Current next twelve months EV/EBITDA helps measuring the enterprise **value of peers in relative** terms. It does not take into consideration the capital structure, reflecting mainly the **operational performance**. Vidrala and Zignago Vetro's multiples are way **above the average of 7.9x (10.2x and 11.2x** respectively). While these companies may be more competitive and should have an above the average entry multiple, it does **not seem reasonable** to assume their current trading multiples to enter in the project

1 Vidrala is assumed to be acquired for **€ 1.99Bn** at the end of 2020 and Zignago Vetro one year later for **€ 598.6M**, with the same entry multiple of 7.5x. Adding 3.36% in fees, it results in a **total investment of € 2.67Bn**

2 Taking into consideration the capex requirements for the project and the future cash flow generation, the capital structure is expected to be composed by **65.7% of debt** and **34.3% of equity (5.12x the Sum of EBITDA of Vidrala and Zignago).** These figures show lower leverage when compared with deal of Apollo which took place in 2015

3 Considering the entry levels of each company separately: Vidrala is acquired with **63.6% of Debt** and **36.4% of Equity**, while Zignago Vetro is acquired with **72% of Debt** and **27% of Equity**

4 The Management Team receives **ownership of 10%** of the Ordinary Shares. For that, they pay **2x their fixed component of the annual salary** at entry (to guarantee they have "skin in the game"). The Institutional Investors figure is computed maintaining the price paid per % of ownership equal to the management team. The Fixed Return Instrument accounts for the rest of the equity and has a **hurdle rate of 10%**. The second capital call is done through an FRI in order not to dilute the Management Team

vidrala

Entry debt is assumed to account for 66% of the capital structure, representing 5.12x the EBITDA for the both firms

Sources of Funds (2)

Debt	In million €	EBITDA Vidrala x	% of Total
Vidrala			
Senior debt	1 054.3	**5x**	**39.5%**
Subordinated debt	263 .6	**1x**	**9.9%**
Zignago Vetro		EBITDA Zignago x	
Senior debt	436.7	**5.5x**	**16.3%**
Total debt	**1 754.6**		**65.7%**

(3)

Equity	In million €	EBITDA Vidrala x	% of Total
Vidrala			
FRI	692.7	**2.63x**	**25.9%**
Ordinary Equity	63.2	**0.2x**	**2.4%**
Inst. Investor	56. 9		
Sweet Equity	6.3		
Zignago Vetro		EBITDA Zignago x	
FRI	161.9	**2.04x**	**6.1%**
Total Equity	**917.8**		**34.3%**
TOTAL SOURCES	**2 672.4**	**7.79x**	**100%**

(4)

Uses of Funds (1)

Enterprise Value	In million €	% of Total Uses
Vidrala EBITDA 2020	263.6	
Zignago EBITDA 2021	79.4	
Entry Multiple	7.5x	
Total EV	**2 585.6**	**96.64%**

Fees	In million €	% of Total Uses
DD Fees	25.9	1.0%
Advisory Fees	25.9	1.0%
Banking Fees	35.0	1.36%
Total Fees	**86.8**	**3.36%**
TOTAL USES	**2 672.4**	**100%**

Assuming an Exit in 2025, the Institutional Investors are expected to obtain a money multiple of 2.8x and an IRR of 23.6%

Exit Waterfall (in million €)

- After an Investment period of 5 years, the Exit is planned for 2025. At this point the sum of the **EV and Cash adds up to € 3.9Bn**
- At Exit, fees were considered lower in percentage of the Total deal since there are lower due diligence requirements, banking and advisory fees. The total amount of Debt which is still left to amortize from both Debt calls is close to **€ 1.1Bn**, and there is still a total of approximately **€ 2.7Bn** left to be distributed to the Fund and the Management Team. The ordinary shares were distributed at exit according to a 90/10 split (10% to the management team)

Institutional and Management Returns

- **Institutional Investors:** The institutional investors enter the deal with a total of € 911M, divided into FRI (€ 855M) and Ordinary Shares (€ 57M). At exit, the institutional investors are expected to get a total of **€ 2.5Bn**, yielding a **MM of 2.8x and an IRR of 23.6%**

- **Management Team:** The management team pays a total of € 6.3M for 10% of the Ordinary shares. After 5 years they are expected to receive € 132M. The payoff to the management team is expected to yield an **IRR of 83.27% and a money multiple of 20.9x**. The 2nd capital call to acquire Zignago (€ 162M) is done with a Fixed Return Instrument to **avoid dilution Management team**

Money Multiple

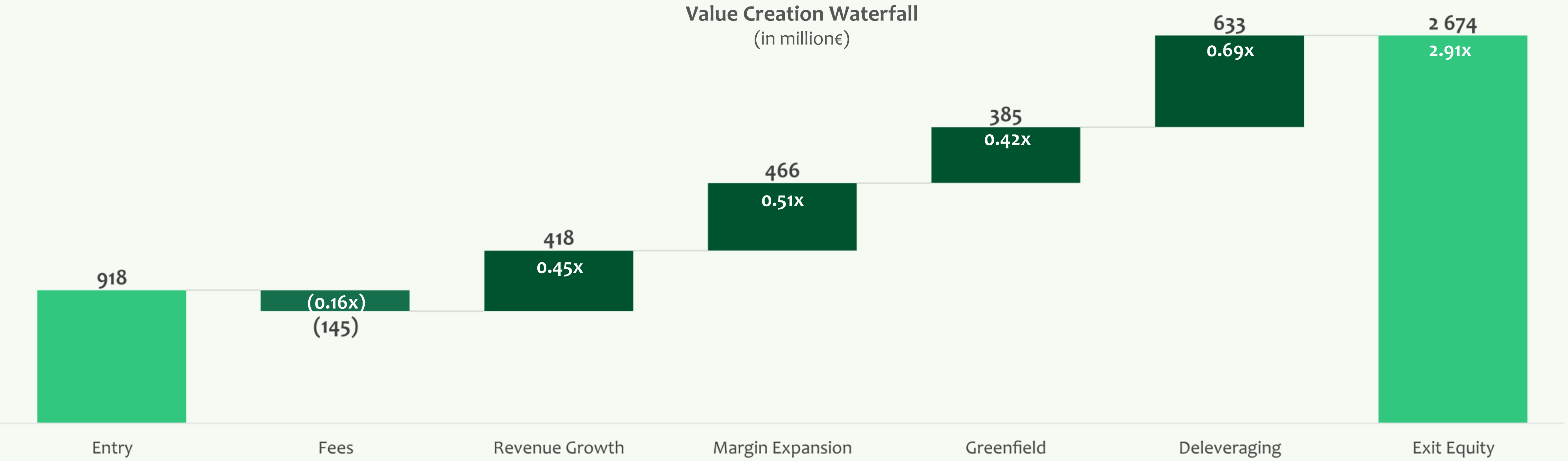
Exit Multiple	2024	2025	2026
7.0x	2.19x	2.54x	2.88x
7.5x	2.43x	2.79x	3.14x
8.0x	2.67x	3.04x	3.40x

IRR

Exit Multiple	2024	2025	2026
7.0x	22.7%	21.3%	19.9%
7.5x	26.0%	23.6%	21.7%
8.0x	29.1%	25.8%	23.3%

	Entry Proceeds	Recap.	Exit Proceeds
Inst. Investors			
Fixed Return Instrument	€ 693M	€ 162M	€ 1 353M
Inst. Investor Shares	€ 57M		€ 1 189M
Returns Management			
Sweet Equity	€ 6M		€ 132M

While deleveraging is the largest contributor to the value creation, operational improvements have similar contribution to exit equity



Revenue Growth

- Revenue growth value creation comes from market growth, driven by **population growth, urbanization** and **premiumization** of the end markets
- Since estimates use market values, there is still **potential for an increase in market share**

Margin Expansion

- M&A synergies are represented in this category, driven by:
  - **Reduction in COGS** by increase in usage of Cullet
  - **Increased automation** and increasing revenue per employee
  - **Reduction of sales expense** in overlapping markets

Greenfield

- € 385M is the value at exit, i.e, exit multiple times the exit EBITDA
- This value is driven by **better margins than other factories,** mainly due to cheaper labour
- Without the Greenfield development the deleveraging effect would be higher and there would be more room for leverage at entry

Deleveraging

- Vidrala and Zignago Vetro's cash generation ability allow for **increased usage of leverage and quick repayments**
- Compared to past M&A transactions, **forecasted Debt/EBITDA is smaller than competition**, signalling room for more returns

The transaction is more sensitive to the entry multiple rather than exit multiples and IRR decreases with the exit year

Fund's Money Multiple

Exit Multiple	Entry Multiple 6.5x	7.0x	7.5x	8.0x	8.5x
6.5x	3.61x	2.80x	2.29x	1.95x	1.70x
7.0x	4.02x	3.10x	2.54x	2.16x	1.88x
7.5x	4.42x	3.41x	2.79x	2.37x	2.06x
8.0x	4.82x	3.72x	3.04x	2.58x	2.24x
8.5x	5.23x	4.03x	3.29x	2.78x	2.42x

Exit Multiple	Exit Year 2023	2024	2025	2026	2027
6.5x	1.46x	1.95x	2.29x	2.63x	2.99x
7.0x	1.67x	2.19x	2.54x	2.88x	3.26x
7.5x	1.88x	2.43x	2.79x	3.14x	3.53x
8.0x	2.10x	2.67x	3.04x	3.40x	3.79x
8.5x	2.31x	2.91x	3.29x	3.66x	4.06x

Fund's IRR

Exit Multiple	Entry Multiple 6.5x	7.0x	7.5x	8.0x	8.5x
6.5x	30.2%	23.6%	18.7%	14.8%	11.7%
7.0x	33.0%	26.3%	21.3%	17.3%	14.0%
7.5x	35.7%	28.8%	23.6%	19.5%	16.2%
8.0x	38.1%	31.1%	25.8%	21.6%	18.2%
8.5x	40.4%	33.2%	27.9%	23.6%	20.1%

Exit Multiple	Exit Year 2023	2024	2025	2026	2027
6.5x	14.2%	19.1%	18.7%	18.0%	17.4%
7.0x	19.8%	22.7%	21.3%	19.9%	18.9%
7.5x	25.0%	26.0%	23.6%	21.7%	20.2%
8.0x	29.8%	29.1%	25.8%	23.3%	21.5%
8.5x	34.3%	32.0%	27.9%	24.9%	22.7%

- Within the base case the investment shows **more sensitivity to entry multiple** rather than exit levels, as the same movement in the multiple creates larger impact when considering a movement along the entry multiple
- The later the exit takes place money multiple increases but at a lower IRR. This happens because the rate at which- operational improvements, synergies and revenue- grows decreases from 2024 onwards. On top of this, the greenfield development is at full scale by the end of 2024

Revenue growth and greenfield feasibility are the most critical assumptions to evaluate on the Due Diligence process

Comments on the individual impact of each sensitivity analysis

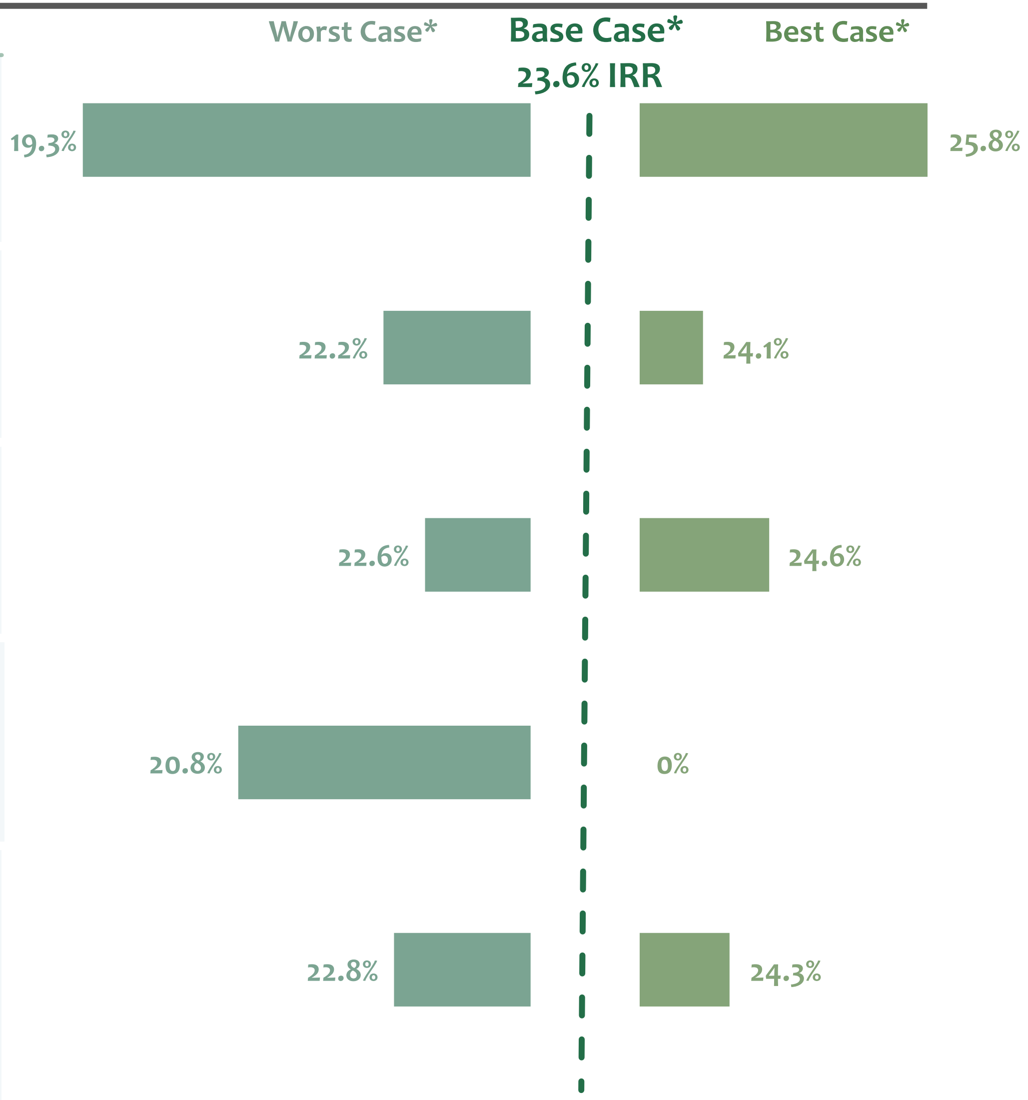
Revenue CAGR sensitivity
Revenue growth is calculated using **price and volume changes** which were based on drivers previously identified. The fact that the worst-case scenario can cause a downside IRR impact of 4.3% makes this a key area to focus on the Due Diligence Process

Revenue per Employee sensitivity
Operational Improvements reflected in **the revenue per employee** are assumed to be of key importance to the deal. Here, the impact on the size of the growth rate (CAGR) is measured. At the modelled worst case, IRR would still be above the 22% which makes this assumption less distressing

Zignago Vetro Synergies sensitivity
This analysis is to evaluate the effect of Zignago Vetro on improving current Vidrala's operations: Cost of Goods Sold in Italy and Sales Expenses. The impact on IRR is also quite significant, so this should also be an item to take into consideration in the Due Diligence

Greenfield sensitivity
The impact **of no Greenfield development** is also measured. Note that without Greenfield, the cash generation (deleveraging) process would be higher and so it offsets in part the importance of the new factory to the returns. It is a key variable to the deal, but removing it would also allow for more leverage at entry, increasing the "worst-case" IRR

Greenfield operational sensitivity
In this calculation, the impact of the **efficiency levels of the Romanian** factory in the first two years and the **average revenue per furnace is measured.** The intermediate change compared to base case indicates that the assumptions are not aggressive and most of the value is generated at exit Due to a high EBITDA margin of 44%, a sensitivity to this value was also made to assess the **breakeven EBITDA and EBITDA Margin**. The conclusion was that **for an EBITDA margin higher than 16.5% (€ 18M in EBITDA)** and everything else constant, the project begins increasing the deal's IRR



***Information regarding the scenarios provided in Additional Considerations**

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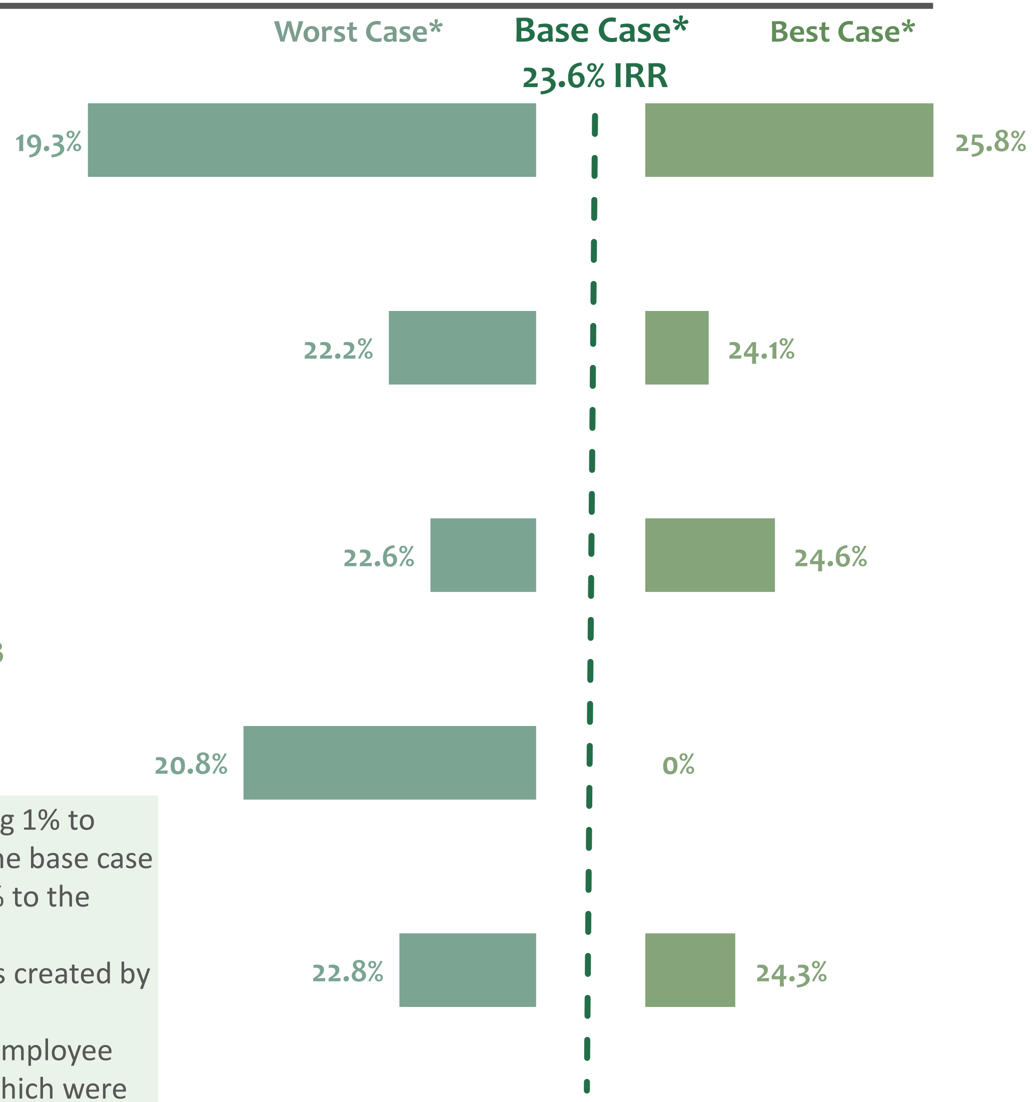
Revenue growth assumptions are the most critical to evaluate on the Due Diligence process

	Worst Case	Base Case	Best case
Revenue CAGR			
Vidrala	1.3%	3.29%	4.79%
Iberian Peninsula	1.3%	3.21%	4.71%
UK & Ireland	1.3%	3.46%	4.96%
Italy	1.3%	3.07%	4.57%
Zignago	1.3%	3.10%	4.60%
Greenfield	1.3%	3.3%	4.79%
Revenue per Employee CAGR			
Vidrala	1.4%	2.42%	2.9%
Zignago	1.4%	2.38%	2.9%
Synergies Zignago			
Cogs Italy synergy	2.0%	7.0%	12.0%
Sales Expenses	0.0%	1.0%	2.0%
Greenfield Operational sensitivity			
Average Revenue per Furnace	€ 42,565.77	€ 53,207	€ 58,527.93
Number of Employees Needed	453	353	303
Efficiency Y1	90.0%	50.0%	40.0%
Efficiency Y2	70.0%	30%	10.0%



- **Revenue CAGR-** Base method based on our market forecast methodology. Worst created by subtracting 1% to historical median organic growth rates of Vidrala (~2% below Base scenario). Best Case adds 1.5% to the base case
- **Revenue per employee CAGR-** Base scenario based on operational capex. Worst Scenario subtracts 1% to the base case, best scenario adds 0.5% to the base scenario.
- **Synergies Zignago-** Base scenario based on potential for synergies identified in Vidrala. COGS scenarios created by adding and subtracting 5%. Sales expenses scenarios created by adding and subtracting 1%
- **Greenfield Operational Sensitivity-** Base scenario for Average Revenue per furnace and Revenue per employee created by using averages of Vidrala´s Balance Sheet. Efficiency scenarios created using assumptions which were seemed reasonable when compared with news observed

vidrala

Due to the deal size IPO and Strategic Sale are the most relevant exit strategies

	Advantages	Disadvantages	Potential Buyers	Relevance
IPO	• Both Vidrala and the main acquisition targets are already Publicly traded • Deal size won't cause any strain in taking company public	• Higher degree of uncertainty of returns due to being dependent on market conditions	BME X – Bolsas y Mercados Españoles	
Strategic Sale	• Follows trend of industry consolidation • Interesting target due to high degree of automation from Vidrala • Evidence of cross-continent M&A activity in this sector (CVC with BA Glass)	• Possible red flag from competition authorities due to excessive industry concentration • Higher difficulty to find buyers when compared with IPO	O-I, Ardagh Group	
Secondary Buyout	• Private Equity activity with highest dry-powder level in history ($2.5Tn) • Attractive target with stable cash flows and recent greenfield development at exit • Ability to partner with strategic buyer	• Deal size excludes many buyers, creating a large necessity for a club deal • Negotiations can lower the possibility of returns derived from multiple arbitrage	CVC Capital Partners, Apollo, The Carlyle Group	
Sale in Parts	• Potential due to competitive concentration in western Europe • Clients may wish to vertically integrate some factories	• Loss of Synergies already present and obtained from acquisitions • Difficulty/work needed to find a buyer for each part	O-I, Ardagh Group, Gerresheimer, Verallia, BA, Heineken	

Note: Heineken included since in a company report is mentioned to be a client both in Great Britain and in Continental Europe

Owens-Illinois could strengthen its European position by acquiring Vidrala

Overview

Summary

Location:	US
Revenue:	$ 6 691M
Ownership:	Public

Relevance

- Similar product portfolio to Vidrala
- 34 out of 78 manufacturing facilities are in Europe
- Experience in making large deals (Vitro)
- Net Debt estimate FY 19: $ 5Bn

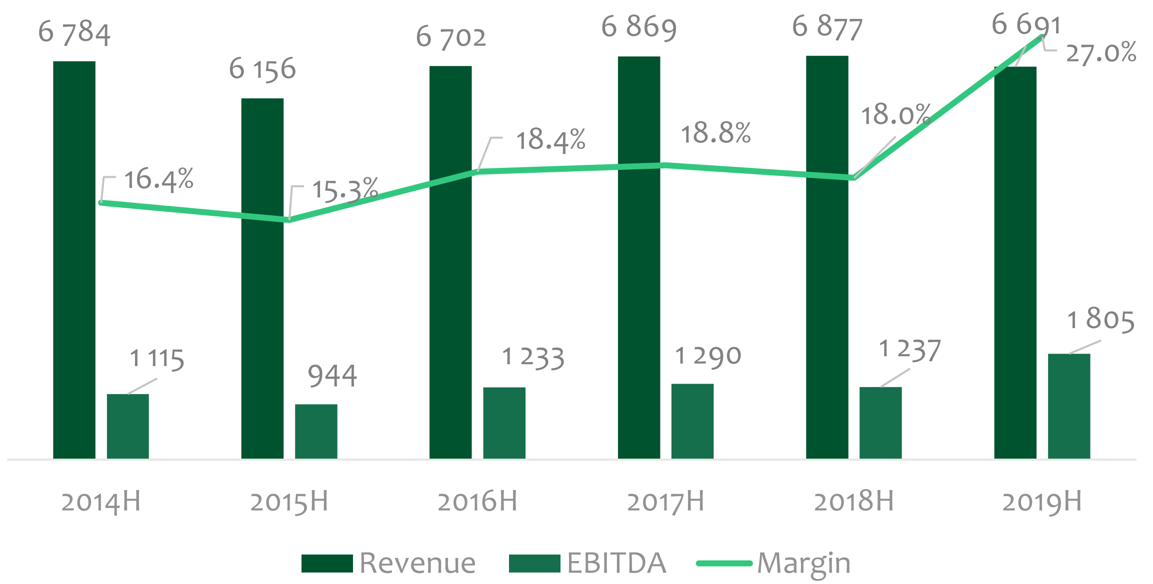
Current Management Team

Name	Role	Tenure
Andres Alberto Lopez	CEO	1986 (2016 CEO)
John Haudrich	CFO	2009 (2019 CFO)
Giancarlo Currarino	CTO/CSCO	2000 (2016)

Relevant Recent M&A

- 2019: Nueva Fábrica Nacional de Vidro. EV: $ 188M
- **2015: Vitro. EV: $ 2.15Bn**

Historical Financials, in Million $



Product Mix

- Wine
- Beer
- Food
- Other Beverages

Relevance

Sources: Owens-Illinois, Macro Trends, Wall Street Journal, Bloomberg

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Ardagh has done deals with the same size as forecasted exit EV

Overview

Summary

Location:	US
Revenue:	$ 6 660M
Ownership:	Public

ArdaghGroup

Relevance

- Ardagh has glass and metal packaging solutions for food and beverages.
- Its glass production facilities in Europe are in Germany, Poland and Italy.
- M&A history in large deals
- Net debt FY 2019: $ 5.3 Bn

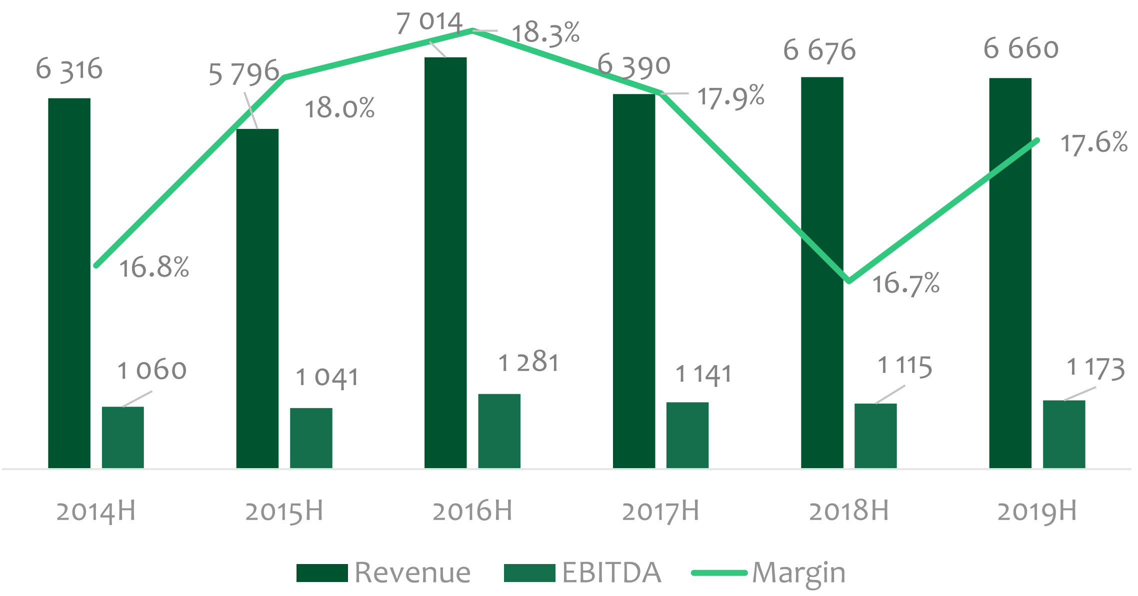
Current Management Team

Name	Role	Tenure
Paul Coulson	CEO	1999 (2017 CEO)
David Mattews	CFO	2014 (2017 CFO)
Shaun Murphy	COO	2019

Relevant Recent M&A

- 2019: Trivium Packaging – spin off
- **2016: Ball Corporation. EV: $ 3.42Bn**

Historical Financials, in Million $ (2017-2019 adjusted due to discontinued operations)



Product Mix

- Beverages - metal
- Beverages - glass
- Food - metal
- Beverages - glass

Relevance

Sources: Ardagh Group, Bloomberg

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Based on the sensitivity analysis, market trends and Zignago Vetro are key issues for the Due Diligence

	Area	Key Aspects to Focus	Potential Issues	Relevance
Commercial DD	**Volume and Price growth trends**	• Analysis on the relevance of the growth drivers identified and on its evolution for the foreseeable future (5-8 years)	• Overestimation of the price evolution • Overestimation of the volume evolution	
Commercial DD	**Customer relationship**	• Analysis of the existing customer contracts • Understanding of the customer behaviour trends regarding time to pay, size and frequency of orders	• Assumptions regarding NWC being too optimistic • Higher NWC due to customer bargaining power	
Commercial DD	**M&A target: Zignago Vetro**	• Operational margins, product mix, cashflow generation, non-reported debt and synergies • Acquisition Process length • Capex Needs	• Assumed synergies impossible to meet • Extra expenses in acquiring and/or lower exit EBITDA • Slower/more expensive integration process	
Financial DD	**Financial Reporting / Accounting**	• Analysis on all reported cash flow relevant accounts • Evaluate current operating cash management • Understand the reason behind the low level of debt • Evaluate the accounts/ assumptions regarding NWC	• Vidrala's fair value being higher/lower • Any practice of fraud • Non-optimal cash management practices that can affect the overall cashflow generation	
Financial DD	**Tax**	• Analysis on the tax breakdown through geography • Find optimal tax structure • Understand the environmental trends regarding tax	• Higher taxes than expected	
Financial DD	**Leases and Fixed Assets**	• Analysis on annual maintenance costs and on maintenance capex • Understand the deals supporting the lease of equipment • Evaluate the real operating leverage	• Higher maintenance capex than expected • Underestimation of operating leverage that can bring extra risk to the deal	

Operations of the Greenfield Expansion also have a significant relevance in the DD process

	Area	Key Aspects to Focus	Potential Issues	Relevance
Operational DD	**R&D and Automation**	• Analysis on the possible implementation of projects regarding product development • Understanding the trend of increasing revenue per employee given its current level of Capex	• Overestimation of the revenue per employee growth driver • Higher Capex costs	
Operational DD	**ERP and IT systems**	• Analysis of the existing ERP systems and its capabilities regarding Industry 4.0 • Evaluate the target's systems and difficulty of integration	• Systems needing an expensive update • Higher integration costs • Longer integration process	
Operational DD	**Greenfield Expansion**	• Ensure that even in worse scenarios of timing and efficiency the project will be profitable • Evaluate the ability to create a strong relationships with suppliers, clients and employees	• Since it is a new market with a different culture, entrance figures might differ from expectations • Value at exit be significantly below than expected	
Legal DD	**Regulatory**	• Evaluate the possibility of Zignago Vetro's acquisition fall due to EU competition law • Understand if Vidrala's business practices are up to code	• Impossibility of obtaining expected returns due to no horizontal integration • Potential fines	
Legal DD	**ESG**	• Analysis of the impact of recent ESG regulations on the Business Plan	• Increasing costs to comply with new regulations • Reputation problems that can impact revenues	
Legal DD	**Potential Litigation**	• Analysis of existing debt covenants and restructuring possibility • Analysis of agreements in place with unions • Pending lawsuits • Analysis of contracts with Customers/suppliers	• Extra financial costs • Employee satisfaction decrease and possible strikes • Compliance costs	

Individual Reflection – João Gonçalves

Potential of Sustainable Packaging for Private Equity Investments

The process of choosing a company for this project started with creating a shortlist of potential companies that could be interesting LBO targets. Such shortlist was assembled by applying knowledge learnt in the Corporate Finance, Applied Corporate Finance, Financial Statement Analysis and Private Equity courses.

The glass packaging industry has historically shown low variation, with companies such as Vidrala making predictable cashflows and allowing for the level of debt typical of this type of investment. Notwithstanding that, management teams of companies within this sector are usually very experienced which can partly explain the continuous improvement in margins within the industry.

However, in this industry it is difficult to create differentiated products, hence the success of potential deals, lies within customer relationships and operational leadership.

Sustainability and ESG are nowadays expressions very present within the vocabulary of entrepreneurs, politicians and businesspeople. It means that businesses that are socially and environmentally friendly can have increased advantages against businesses that do not. These advantages can be either regulatory, mainly in western economies, or from consumer trends that privilege environmentally friendly products.

To conclude, it is expected that in the following years and decades R&D investments, biotech startups and universities keep creating more sustainable solutions that can be scalable to create new solutions (bio plastics) or improve the current ones (less harmful plastics, lighter glass, etc.).

Private Equity and the Portuguese Business Context

Portuguese business environment is dominated by small companies whose owners and managers are low educated when compared to EU countries. In this context, Portuguese Private Equity firms can play a very interesting role.

On the one hand, regarding the size a significant number of companies do not meet the minimum size requirements (revenue, EBITDA, etc.) to be bought by funds. Despite that, within the Portuguese market some companies do meet the criteria, giving space for some opportunities.

On the other hand, education wise is where Portuguese GP's can make most impact. By setting growth paths and leveraging on their business expertise, value should be added in a professional, competent and incentivized way. The focus on medium/long-term value, the increase of highly educated management and implementation of monitoring measures would increase the competitiveness of the Portuguese firms.

Regarding COVID-19, during the first wave, many businesses entered in a layoff scheme period and recurred to a moratorium period, therefore delaying debt repayments. The magnitude of this impact is not yet known, but it is predictable that some otherwise financially sustainable firms require capitalization. Assuming PE funds have the availability, there could be space for interesting distressed and leveraged buyouts.

Finally, the newest generations are becoming more and more educated, with interesting universities located in the coastal districts between Lisbon and Braga, which will increase the supply of educated employees both in quality and quantity in distinct areas from Biotechnology and Engineering to Business and Marketing.

11. Additional Considerations

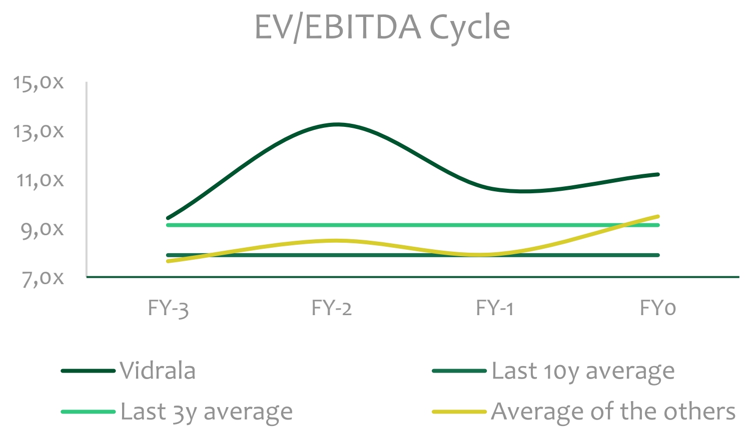
Multiple Arbitrage can be attained due to a positive cycle or based on an historical case

Assumption: no multiple arbitrage at exit.

- The base case modeled returns assumes no multiple arbitrage
- However, it can be possible to obtain better returns due to a favorable EV/EBITDA cycle at exit or by considering the success case Apollo had with Verallia
- Note that other factors could cause such arbitrage, for example ESG trends and legislation that could favor sustainable materials such as glass or harm plastic
- First, regarding the EV/EBITDA multiple has been subject to a certain cyclicality. However, there is no guarantee about the level of the cycle at exit. Hence, including it as base case would be optimistic
- Secondly, Apollo apparently did manage to obtain a multiple arbitrage with Verallia. Hence, there can be a precedent case where the assumption could make sense. Nevertheless, given that the exit multiple is only an estimate and not a given fact it is assumed that no multiple arbitrage would come from this
- All in all, there could be multiple arbitrage due to several reasons however, none of them, neither individually nor collectively allows to claim it with a desirable degree of certainty

Reasoning 1: EV/EBITDA cycle

- EV/EBITDA **trading multiples** for the glass packaging industry have been increasing in the last years (average **9.1x in the past 3 years** vs 7.9x in the past 10 years)
- Vidrala's trading multiple in the last year is slowly increasing after a somehow sharp decrease in the previous year. However, this can be offset given the fact that the LBO model considers a lower valuation than the current trading multiple



Reasoning 2: Verallia Case

- In 2015 the Apollo Global Management fund acquired Verallia at a €2 950M EV valuation implying a **7.4x multiple**
- 4 years later in 2019, according to Reuters, the company was "hoping to fetch a multiple of between **8 and 8.5 times its core earnings** in an IPO"
- At IPO, market capitalization was roughly €3.2Bn and Net Debt was €1.7Bn in April of that year and €1.6B in December
- EBITDA at the end of the year was 615M, leading to an EV/EBITDA multiple of **7.80x to 7.97x** (~0.5x arbitrage)
- Note that there was a yearly EBITDA increase for the whole year so the **arbitrage could be even higher**

Key Figures

Mkt Cap Oct/19	€ 3.2Bn
Net Debt Apr/19	€ 1.7Bn
Net Debt Dec/19	€ 1.6Bn
EBITDA 2019	€ 615M
Multiple Estimate	7.8x-7.97x

Sources: Bloomberg, Reuters, Verallia

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